

# **METHOD AND SYSTEM FOR CAUSE-EFFECT TIME LAPSE ANALYSIS**

## **Background of Invention**

**[0001]** Well logs are measurements, typically with respect to depth, of selected physical parameters of earth formations penetrated by a wellbore. Well logs are typically recorded by inserting various types of measurement instruments disposed on an integrated measurement platform into a wellbore, moving the instruments along the wellbore, and recording the measurements made by the instruments. One type of well log recording includes lowering the instruments at the end of an armored electrical cable, and recording the measurements made with respect to the length of the cable extended into the wellbore. Depth within the wellbore is inferred from the extended length of the cable. Recordings made in this way are substantially directly correlated to measurement depth within the wellbore. Other methods for measurement include a "logging while drilling" (LWD) method, a "measurement while drilling" (MWD) method, and a memory logging method. The LWD method involves attaching the instruments to the lower portion of a drilling tool assembly used to drill the wellbore. LWD and wireline tools are typically used to measure the same sorts of formation parameters, such as density, resistivity, gamma ray, neutron porosity, sigma, ultrasonic measurement, etc. MWD tools are typically used to measure parameters closely associated with drilling, such as well deviation, well azimuth, weight-on-bit, mud flowrate, annular borehole pressure, etc. Document US 6,272,434 illustrates this technology.

**[0002]** The aforementioned well logging tools may be conveyed into and out of a well via wireline cable, drilling pipe, coiled tubing, slickline, etc. Further, LWD and MWD measurement methods allow for measurement in the drill string while